

USSR

BARDYSHEV, V. I.; VELIKANOV, A. M.; GERSHMAN, S. G.; KRYSHNIT, V. I. (Acoustics Institute of the USSR Academy of Sciences, Moscow)

"Underwater Noise Level of the Ocean as a Function of Wind Velocity"

Moscow, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

TRANSLATION: We measured underwater ocean noises at depths of 100 to 130 meters at a distance of 20 km from the shoreline. One hydrophone was attached to a submerged buoy at a depth of 60 meters and was practically unprotected from hydrodynamic noises by the action on it of underwater currents. The second hydrophone was secured at a height of 1.5 meters from the bottom and protected by a deflector which, as indicated by additional studies, substantially lowered the level of hydrodynamic noises at frequencies below 100 cps. Underwater noise levels of the ocean were measured in the third-octave, half-octave, and 1 cps frequency bands over an average time of several seconds and were reduced to a band width of 1 cps and expressed in decibels read from the

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BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

level  $2 \cdot 10^{-5} \text{ m}^2 \cdot \text{cps}^{-1/2}$ . The measurements were made on an average of twice a day over a period of six months. The wind velocity was measured regularly every 3 hours. The Pearson mean square correlation was used for the stochastic dependence of the underwater noise level  $p$  on the wind velocity  $v$ . At those frequencies for which such a correlation was discovered a further study of it was made: in particular, it was ascertained whether there is a correlation between the conditional mathematical expectations of the processes studied. For this purpose there was calculated a correlation ratio  $\eta$ , which is a measure of any type of correlation: linear as well as nonlinear [1]. Further, the degree of linearity of the dependence of  $p$  on  $v$  was established, for which purpose the correlation coefficient  $R$  was calculated and compared with the corresponding value of  $\eta$ : for  $\eta = R$  the dependence is linear; for  $\eta > R$ , it is nonlinear. To establish the fiducial probability of the assertion  $\eta > R$  the method of confidence intervals as well as the distribution  $F$  were used [2]. Lines of regression reflecting the type of correlation of  $p$  with  $v$  were selected by the method of least squares. The calculations were carried out on an electronic computer.

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cps	1.0	4.2	8.3	66.7	140	6600	9600
R	0.15	0.18	0.26	0.41	0.54	0.33	0.39
$\eta$	0.30	0.28	0.36	0.49	0.59	0.44	0.48

It was established that the correlation of  $p$  with  $v$  is the most pronounced at the frequencies 100-200 cps, somewhat weaker at frequencies higher than 200 cps, and the weakest at frequencies below 100 cps. For the given measurements by the first hydrophone the stochastic dependence of  $p$  on  $v$  practically disappears at frequencies below 10 cps (the fiducial probability of a correlation at a frequency of 10 cps does not exceed 50%; at a frequency of 5 cps, 10%). For the given measurements by the second hydrophone a relationship of  $p$  with  $v$  can be traced through the entire frequency interval of measurements—down to a frequency of 1 cps—so that a correlation appears. In the table the values of  $\eta$  and  $R$  are shown for several frequencies for the given measurements of the second hydrophone. For all frequencies the fiducial probability that  $\eta > 0$  is not less than 99.9%. The fiducial probability of the assertion that  $R > 0$  for a frequency of 2.1 cps is not less than 98%; for frequencies of 8.3 cps and higher, more than 99.9%. The fiducial probab-

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BARDYSHEV, V. I., Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971; pp 302-3

ity that  $\eta > R$  appeared to be about 98% for a frequency of 2.1 cps and 80% for frequencies of 8.3 cps and higher. Apparently the correlation of  $p$  with  $v$  can be considered to be nonlinear. This is confirmed also by the fact that the amplitudes of the distribution of the values of  $p$  and  $v$  are substantially different from Gaussian. A linear equation of regression can be used only as a first approximation.

The differences in correlation of  $p$  and  $v$  at low frequencies for the data of the first and second hydrophones are apparently due to the fact that at frequencies below 10 cps with noise recorded by the first hydrophone hydrodynamic pulsation of pressure prevailed, caused by the turbulence of an underwater current (following the terminology of Blokhintsev [3], this effect should be called "pseudo sound"). In the range of measurements made, underwater currents which do not depend on the wind (ebb-flow and constant) predominated. The hydrodynamic noises indicated by the second hydrophone were substantially decreased by the deflection, and noises connected with the wind were more pro-

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nounced. Actually, at frequencies of less than 100 cps the spectral noise levels, according to the data of the second hydrophone, are lower in comparison with those measured by the first hydrophone, and at frequencies of 6 cps and lower the difference is 20-26 decibels. At frequencies lower than 10-20 cps the spectral noise levels, according to the data of the first hydrophone, increases 10-12 decibels when the frequency is lowered an octave; according to the data of the second hydrophone, 3.5-5.0 decibels in all.

#### BIBLIOGRAPHY

1. G. Kramer. "Mathematical Methods of Statistics". Moscow, GTTI, 1948.
2. V. I. Dunin-Barkovskiy, N. V. Smirnov. "Theory of Probability and Mathematical Statistics in Engineering. General Discussion". Moscow, GTTI, 1955.

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BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal; Vol 17, No 2, April-June, 1971;  
pp 302-3

3. D. I. Blokhintsev. "Acoustics of Inhomogeneous Moving Media". Moscow-Leningrad, Gostekhizdat, 1946.

Submitted for publication 23 April, 1970.

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Measuring, Testing, Calibrating, Control

USSR

UDC 534-14

BARDYSHEV, V. I., VELIKANOV, A. M., GERSHMAN, S. G., Acoustics  
Institute, Academy of Sciences, USSR, Moscow

"Some Experimental Investigations of Underwater Ocean Noises"

Moscow, Akusticheskiy Zhurnal, Vol 16, No 4, 1970, pp 602-603

**Abstract:** According to experimental data obtained earlier, at frequencies below 10-30 Hz the spectral density of underwater ocean noises increases, as the frequency is decreased, on an average by 8-12 db per octave. The supposition has been made that the indicated rise in the energy of underwater noise at low frequencies is brought about by the direct action of turbulent pulsations of hydrodynamic pressure upon the hydrophone when a stream of water flows around it ("pseudosound"); this occurs if the hydrophone is situated in a zone of action of underwater currents or is moved with respect to the thickness of the water. If this supposition is valid, it follows that when underwater noise is measured in the zone of action of underwater currents by a hydrophone protected by a fairing, which decreases the level of  $1/2$

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BARDYSHEV, V. I., et al, Akusticheskiy Zhurnal, Vol 16, No 4, 1970, pp 602-603

the pseudosound, the intensity of the underwater noise at low frequencies will be less than when the measurements are made by a hydrophone that is unprotected against the action of the stream. This effect was actually detected in the experimental investigations of underwater ocean noise dealt with in the article. The experimental equipment and procedure are described, and the results are summarized. 1 table, 2 figures, 3 bibliographic entries.

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GERSHMAN, VALERIY

"Three-Dimensional Image on a Photographic Plate"

Riga, Nauka i Tekhnika, No 3 (128), March 1971, pp 21-25

Abstract: This article contains a general and elementary theoretical discussion of holography in the past, present, and future, including the "third generation" of holography introduced by Soviet physicist Yu. N. Denisyuk, for which he received the Lenin Prize in 1970. Diagrams are presented illustrating holographic recording of a three-dimensional object and a point object, generation of an image from a point object hologram, and generation of the image of a three-dimensional object. The Denisyuk method uses a laser for holographic recording of a three-dimensional object, but the image is restored by ordinary light. His technique is also illustrated diagrammatically along with an example of holographic observation of an object under water. Problems of using holography for photographs, movies, and television are noted, and the problem of low-inertia media for recording holograms is briefly discussed. Some simple examples of possible uses of holograms, such as to improve the reliability of recognition of objects by radar systems, are noted.

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1/2 028  
TITLE--REDUCTION OF PERRHENATE IONS WITH MAGNESIUM -U-  
AUTHOR--GERSHOV, V.M.  
COUNTRY OF INFO--USSR  
SOURCE--LATV. PSR ZINAT. AKAD. VESTIS, KIM. SER. 1970, (2), 246-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--RHENIUM COMPOUND, RHENIUM COMPLEX, CHEMICAL REDUCTION,  
MAGNESIUM, ALUMINUM, THIOCYANATE, LIGHT ABSORPTION, PHOTOMETRY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3007/1266  
CIRC ACCESSION NO--AP0136672  
UNCLASSIFIED

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PROCESSING DATE--04DEC70

STEP NO--UR/0464/70/000/002/0246/0247

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UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136672  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE REDUCING PROPERTIES OF MG, AL,  
AND DEVARDA'S ALLOY ON RED SUB4 PRIME NEGATIVE IN AN ACID MEDIUM ARE  
COMPARED BY OBSERVING THE CHANGE IN ABSORBANCE, DUE TO THE FORMATION OF  
A STABLE, HIGHLY COLORED COMPLEX OF THE REDUCED FORMS OF RE WITH SCN  
PRIME NEGATIVE. MG IS BY FAR THE BEST REDUCING AGENT, PRODUCING REDN.  
PRODUCT CONCNS. UP TO 20 TIMES GREATER THAN WITH THE OTHER 2 REDUCING  
AGENTS. FACILITY: INST. NEORG. KHIM., RIGA, USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--DETERMINATION OF THE PH OF THE LAYER NEAR THE ELECTRODE USING A  
METALLIZED GLASS ELECTRODE -U-  
AUTHOR--GERSHOV, V.M., PURINS, B. G  
COUNTRY OF INFO--USSR  
SOURCE--LATV. PSR ZINAT. AKAD. VESTIS, KIM. SER. 1970, (1), 123-4  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--IONIZATION CONSTANT, MEASUREMENT, ELECTROLYTE, GLASS  
ELECTRODE, HYDROGEN ION CONCENTRATION, PH METER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1989/0534 STEP NO--UR/0464/70/000/001/0123/0124  
CIRC ACCESSION NO--AP0107139  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107139

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A METHOD FOR DETG. THE PH OF AN ELECTROLYTE LAYER NEAR THE ELECTRODES DURING ELECTROLYSIS WAS DEVELOPED. THE ELECTRODES WERE COATED WITH A METAL, BY ELECTROLYTIC DEPOSITION OR SPRAYING, WHICH COULD READILY BE APPLIED AS PARTICLES WITH DIAM. 0.1-0.2MM. THE PH INSTRUMENT READING, WHICH IS DISTORTED BY THE PRESENCE OF THE METAL, CAN BE EXPRESSED AS,  $PH_{SUBO} = K (PHI_{SUBO} + \Delta PHI_{SUB1}) + F (PHI_{ME})$ , WHEN NO SUPERIMPOSED CURRENT IS APPLIED, AND AS,  $PH_{SUB1} = K (PHI_{SUBO} + \Delta PHI_{SUB2}) + F' (\Delta PHI_{ME})$ , WHEN AN ELEC. CURRENT IS SUPERIMPOSED, WHERE  $PHI_{SUBO}$  IS THE POTENTIAL CORRESPONDING TO THE PH OF THE SOLN.;  $\Delta PHI_{SUB1}$  AND  $\Delta PHI_{SUB2}$  REPRESENT THE SHIFT OF POTENTIAL DUE TO THE CHANGE OF PH NEAR THE METALLIZED ELECTRODE, BEFORE AND AFTER POLARIZING THE ELECTRODE, RESP.;  $F (PHI_{ME})$  AND  $F' (\Delta PHI_{ME})$  REPRESENT THE ERROR IN PH INSTRUMENT READING DUE TO THE MAGNITUDE OF THE METAL POTENTIAL AND THE DEGREE OF POLARIZATION, RESP.; AND  $K$  IS A CONST. THEN, IF THE METAL IS DEPOSITED WITH 100PERCENT YIELD ON THE CURRENT USED AND ITS POTENTIAL IS MEASURED WITH SUPERIMPOSITION,  $PH_{SUBP} = PH_{SUB1} - F' (\Delta PHI_{ME})$ , SINCE  $\Delta PHI_{SUB1} = \Delta PHI_{SUB2} = 0$ . BOTH PRACTICAL AND MORE PRECISE METHODS OF MEASURING THE ERRORS IN PH INSTRUMENT READINGS WERE DEVELOPED.

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GERSHTEYN, G.M.

# Induced Current

New Books

("Nauka" Publishing House)

JPRS 52887  
15 April 1971

Physical, Mathematical and Technical Sciences

T.A. Agabekyan. Verdy, galaktiki, matagalaktiki (Stars, Galaxies, and Metagalaxies). Moscow, 1970, 334 pages with 111, 21,000 copies, 88 k.

Kuteczizatsiya operativnyy proyektirovaniya protsessov (Automation of Operations in the Planning of Machine-Building Processes). Collection of Articles. Institute of Machine-Building. Moscow, 1970, 192 pages, 2800 copies, 71. k.

Voprosy optimizatsii razvitiya energosistem i novyya tekhnicheskaya sredstva ikh zashchity (Questions in the Optimal Development of Power Systems and New Technical Means of their Protection). Collection of Articles. Moscow, 1970, 158 pages, 1300 copies, 63 k.

G.M. Gershteyn. Modelirovaniya polny metodom elektromagnitnoy induktsii (magnetostatika) (Modelling of Fields by the Method of Electromagnetic Induction (Induced Current)). Moscow, 1970, 316 pages, 5000 copies, 1 r 40 k.

Y. L. Gruzov and G. I. Novikov. Elektronnaya protsessy v invertorakh na polnost'yu upravlyayemykh ventilyakh (Electromagnetic Processes in Invertors on Completely Controllable Valves). Leningrad, 1970, 100 pages, 1200 copies, 60 k.

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UDC: 538.56:543.42

KRUPNOV, A. P., GERSHTEYN, L. I., SHUSTROV, V. G., and BELOV, S. P.

"Millimeter and Submillimeter Radio Spectroscope with Acoustical Indication"

Gor'kiy, Izvestiya VUZ -- Radiofizika, Vol. 13, No. 9, pp 1403-1405

Abstract: As far as the authors know, the device they propose is the first of its kind to use the principle of acoustic sensing in radio spectroscopy -- i.e., in investigating the microwave absorption spectrum of a gas filling the sensor cell. The authors designed and tested their spectroscope, basically following the design proposed by M. Golay (Rev. Sci. Instr. 18, 1947, p 557), in the wavelength range of 0.5 to 2.4 mm. This brief communication gives the preliminary results of those tests and considers some of the advantages of acoustical sensing. A block diagram of the system is shown. The cell has a side wall which is a membrane forming one plate of a condenser microphone. The power absorbed heats the gas, which expands and bends the membrane, thus setting

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MEURON, A.P., et al, Investiya VOZ - Radiofizika, Vol 13, No 9, pp 1403-1405

up a signal which is amplified. The constant component of the pressure on the membrane is eliminated by mechanical decoupling, and the spectral lines are observed on an oscilloscope. In the tests, a backward wave tube was used as the radiation source. It was found that the sensitivity of this device exceeds that of the best centimeter wavelength radio spectrometers, at least in theory. The authors admit, however, that their prototype's sensitivity was less than the limiting  $10^{-6}$  watts as a consequence, primarily, of the poor construction of the microphone, which was insensitive and subject to vibration. They express their gratitude to Ye. N. Karyakin and N. N. Sem'yanskiy for their help in setting up the equipment, and to Yu. A. Dryagin, A. I. Naumov, and L. I. Fedoseyev for their valuable comments and their contribution of the backward wave tube, and finally to A. V. Gaponov for his comments on the manuscript.

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1/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--MICROWAVE SPECTROSCOPY OF FORMALDEHYDE -U-  
AUTHOR-(04)-KRUPNOV, A.F., GERSHTEYN, L.I., SHUSTROV, V.G., POLYAKOV, V.V.  
COUNTRY OF INFO--USSR  
SOURCE--OPT. SPEKTROSK. 1970, 28(3), 480-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--MICROWAVE SPECTROSCOPY, FORMALDEHYDE, ROTATIONAL SPECTRUM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/0802 STEP NO--UR/0051/70/028/003/0480/0486  
CIRC ACCESSION NO--AP0119709  
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PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119709

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ROTATIONAL SPECTRUM OF HCHO WAS STUDIED IN THE FREQUENCY RANGE 350-580 GHZ. FREQUENCIES OF 29 LINES WERE MEASURED CORRESPONDING TO THE TRANSITIONS  $I \rightarrow I+1$  (I EQUALS 4 YIELDS 5, I EQUALS 5 YIELDS 6, I EQUALS 6 YIELDS 7, I EQUALS 7 YIELDS 8). ON THE BASIS OF THE EXPTL. RESULTS COR. VALUES OF CENTRIFUGAL CONSTS. WERE USED FOR CALC. OF THEORETICAL SUB,MM SPECTRUM OF HCHO. THE CALCD. SPECTRUM AGREED WELL WITH THE EXPTL. ONE (ROOT MEAN SQUARE ERROR 3 TIMES 10 PRIME NEGATIVE 6). ALSO MORE PRECISE ROTATIONAL CONSTS. B SUB0 (38835.369 PLUS OR MINUS 0.004 MHZ) AND C SUB0 (34003.282 PLUS OR MINUS 0.004 MHZ) WERE CALCD.

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GERSHTEYN, S. S., KOBZAREV, I. YU. and OKUN', L. B.

"Generation of  $K^0$ -Mesons and the Pomeranchuk Theorem"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol. 11, No. 1,  
5 Jan 70, pp 75-80

Abstract: Data obtained at Serpukhov showing that the cross sections for  $K^-$ -mesons are constant in the interval 20-55 GeV/c and obtained earlier at Brookhaven showing that the cross sections for  $K^+$ -mesons are constant in the interval 6-20 GeV/c do not contradict the hypothesis that  $K^+$  cross sections would pass to a constant asymptotic limit above 6 GeV/c and that  $K^-$  cross sections would pass to a limit above 20 GeV/c, so that as  $E \rightarrow \infty$ :

$$\sigma_{K^-p} - \sigma_{K^+p} = 3,5 \pm 0,5 \quad \text{mbarn} \quad \sigma_{K^-d} - \sigma_{K^+d} = (6 \pm 1) \quad \text{mbarn}$$

$$\sigma_{K^-n} - \sigma_{K^+n} = 2,5 \pm 1,5 \quad \text{mbarn}$$

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GERSHTEYN, S. S., et al, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol. 11, No. 1, 5 Jan 70, pp 75-80

If this were so, the Pomeranchuk theorem (ZhETF, Vol. 34, 1958, p 725), according to which  $\sigma = \bar{\sigma}$  as  $E \rightarrow \infty$ , would be violated. It turns out that the data of these two experiments do not in any way prove that the cross sections  $\sigma_{K^+p}$  and  $\sigma_{K^-p}$  actually pass to their asymptotic constant limits. In particular, it is possible that the cross section  $\sigma_{K^+p}$  begins to rise beginning with 20 Gev and approaches  $\sigma_{K^-p}$ . As for  $\sigma_{K^-p}$ , in the region  $E = 20$  Gev it can be approximated within the existing error not only by a horizontal line but by a curve that drops slowly with the growth of energy and also by a curve having a minimum. The purpose of this work is to note that the hypothesis that  $\sigma_{KN} - \sigma_{\bar{K}N} = \text{const} \neq 0$  as  $E \rightarrow \infty$  leads to several clear predictions relative to the regeneration of  $K^0$ -mesons. If the experiments do not contradict these predictions, it will mean that the hypothesis is incorrect. This paper was delivered at a conference on high-energy physics in Kiev on 22 December 1969.

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1/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--REGENERATION OF K PRIME MESONS AND THE POMERANCHUK THEOREM -U-  
AUTHOR--(03)-GERSHTEIN, S.S., KOBZAREV, I.YU., OKUN, L.B.  
COUNTRY OF INFO--USSR  
SOURCE--JETP LETTERS (USA), VOL. 11, NO. 2, P. 75-80, JAN. 1970  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--K MESON, ENERGY SPECTRUM, DIFFERENTIAL CROSS SECTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--3005/1746

STEP NO--US/C000/70/011/001/0075/0080

CIRC ACCESSION NO--AP0133651

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PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0133651

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. NOTES THAT THE HYPOTHESIS SIGMA  
SUBKN SIGMA SUBKN EQUALS CONST NOT EQUAL TO 0 AS E YIELDS INFINITY LEADS  
TO A NUMBER OF DISTINCT PREDICTIONS PERTAINING TO K PRIMEO MESON  
REGENERATION.

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1/2 011 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--REGENERATION OF K PRIMEO MESONS AND THE POMERANCHUK THEOREM -U-

AUTHOR-(03)-GER SHEYN, S.S., KOBZAREV, I.YU., OKUN, L.B.

COUNTRY OF INFO--USSR

SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 1970, 11(1), 75-80

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--K MESON, NUCLEON INTERACTION, HIGH ENERGY PARTICLE, PARTICLE  
FORMATION, PARTICLE CROSS SECTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1988/0666

STEP NO--UR/0386/70/011/001/0075/0080

CIRC ACCESSION NO--AP0105642

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PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0105642

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPTS. AIMED AT DETG. THE  
REGENERATION AMPLITUDE OF K MESONS AT ENERGIES UP TO 6 GEV ARE  
RECOGNIZED AS THE CLUE FOR TESTING THE HYPOTHESIS THAT THE CROSS SECTION  
DIFFERENCE FOR THE KN AND BAR K N DOUBLETS SHOULD BE A CONST. DIFFERENT  
FROM ZERO WHEN E YIELDS INFINITY. POMERANCHUK'S THEOREM WOULD NOT BE  
VIOLATED IF THE HYPOTHESIS WERE SHOWN TO BE TRUE (I. YA. POMERANCHUK,  
1965).

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UDC 669.715'721:620.186:669.018.8:669.018.8

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KOL'TSOV, V. M., KISHMERESHKIN, I. G., GERSHTEYN, V. D., UST'YANTSEV, V. U.,  
and PAVLENKO, Z. A.

"Influence of Certain Technological Factors on the Structure and Properties  
of AMg6 Alloy Sheet"

Tekhnol. legkikh splavov. Nauchno-tekhn. byul. VILSa (Technology of Light  
Alloys. Scientific and Technical Bulletin of the All-Union Institute of  
Light Alloys), 1970, No 3, pp 20-23 (from RZh-Metallurgiya, No 12, Dec 70,  
Abstract No 12 1752 by I. NABATOVA)

Translation: An investigation was made of the structure, mechanical properties,  
and corrosion resistance of cold-rolled, 1-, 2- and 4-mm-thick AMg6 alloy sheet  
as a function of variations in chemical composition, degree of deformation  
(5-50%), and annealing regime in a range of 230-500°. Sheet properties were  
not significantly affected by variation in chemical composition (within the  
limits of the All-Union State Standard) or in heating rate (50, 100, and  
> 1000 deg/hr) or in cooling rate (25, 50 deg/hr and air cooling). The max-  
imum value of  $\sigma_{0.2}$ , viz., 20.5 kg/mm<sup>2</sup>, was obtained with a deformation degree  
of 30% and an annealing temperature of 280°. Heating at 100° for 100 hours  
in the event of prior annealing at temperatures > 300° causes the evolution  
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KOL'TSOV, V. M., et al, Tekhnol. legkikh splavov. Nauchno-tekhn. byul, VILSa (Technology of Light Alloys. Scientific and Technical Bulletin of the All-Union Institute of Light Alloys), 1970, No 3, pp 20-23 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1752 by I. NABATOVA)

of particles of the Al-Mg phase over the grain boundaries and a lessening of corrosion resistance of the sheet. The combination of high corrosion resistance and satisfactory mechanical properties of the sheet is assured at an annealing temperature of 280-300°. Five illustrations. One table.

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1/2 038 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--SPECTRUM OF CONVECTIVE INSTABILITY IN A VERTICAL CHANNEL WITH  
POROUS BOUNDARIES -U-  
AUTHOR--(03)-GERSHUNI, G.Z., ZHUKHOVITSKIY, YE.M., SHVARTSBLAT, D.L.  
COUNTRY OF INFO--USSR  
SOURCE--PRIKLADNAIA MATEMATIKA I MEKHANIKA, VOL. 34, JAN.-FEB. 1970, P.  
150-152  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FLOW STABILITY, THERMAL CONVECTION, POROSITY, FLUID FLOW,  
NUMERIC SOLUTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1446

STEP NO--UR/0040/70/034/000/0150/0152

CIRC ACCESSION NO--AP0106202

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE—30OCT70

2/2 038

CIRC ACCESSION NO—AP0106202

ABSTRACT/EXTRACT—(U) GP-0-

ABSTRACT. RESULTS OF A NUMERICAL STUDY OF THE SPECTRA OF NONSTATIONARY CONVECTIVE DISTURBANCES IN A FLUID WHICH IS HEATED FROM BELOW AND CONTAINED IN A PLANE VERTICAL CHANNEL WITH POROUS WALLS. PREVIOUS STUDIES SHOWED THAT THE CHARACTERISTIC RAYLEIGH NUMBERS GOVERNING THE LIMITS OF STABILITY WITH RESPECT TO STATIONARY DISTURBANCES DEPEND ON THE VELOCITY OF TRANSVERSE FLUID MOTION; INCREASED PECLET NUMBERS ARE ACCOMPANIED BY A LOCKING OF NEIGHBORING LEVELS OF THE INSTABILITY SPECTRUM. IT WAS HYPOTHESIZED THAT THIS BLENDING OF THE LEVELS OF STATIONARY MOTIONS IS ACCOMPANIED BY THE ONSET OF OSCILLATORY CONVECTIVE MOTIONS. THE PRESENT RESULTS CONFIRM THAT HIGHER PECLET NUMBERS RESULT IN A CONVECTIVE MOTION OF THE STATIONARY OSCILLATION TYPE. DEPENDING ON THE PECLET NUMBER, THE FUNDAMENTAL STATE (TRANSVERSE FLUID MOTION) IS UNSTABLE WITH RESPECT TO EITHER MONOTONIC OR OSCILLATING DISTURBANCES. ANALYSIS OF THE SPECTRA DEFINES THE BOUNDARIES OF BOTH TYPES OF INSTABILITIES.

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BAGDASAROV, KH. S., DOBROVINSKAYA, YE. R., PISHCHIK, V. V., CHERNIK, M. M., KOVALEV, YU. YU., GERSHUE, A. S., ZVYAGINTSEVA, I. P., All-Union Scientific Research Institute of Single Crystals

"Low-Dislocation Single Crystals of Corundum"

Moscow, Kristallografiya, Vol 18, No 2, Mar-Apr 73, pp 390-395.

Abstract: The relationship of growth conditions and quality of structure of corundum single crystals is studied. The influence of spatial orientation, temperature gradient and stability of thermal conditions on formation of dislocations in crystals of corundum grown by directed crystallization is studied. Proper selection of orientations minimized the influence of structural defects in an etched crystal and practically eliminated heredity of dislocations arising in the growth process. Investigation and consideration of three-dimensional orientation and crystallization conditions on structural quality allowed the production of low-dislocation single crystals of lucosapphire.

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1/2 017 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--SELECTION AND CHARACTERISTICS OF L CELL SUBLINES RESISTANT TO  
3-AZAGUANINE -U-  
AUTHOR--(04)-ADDMAYTIYENE, D., IGNATOVA, T.N., PODGAYETSKAYA, D.YA.,  
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. L CELL SUBLINES RESISTANT TO 8-AZAGUANINE WERE OBTAINED DURING TREATMENT WITH THIS COMPO., AND RETAINED THEIR RESISTANCE AFTER SEVERAL MONTHS OF REPRODUCTION IN VIVO AND IN VITRO EVEN IN THE ABSENCE OF DRUGS, SUGGESTING THE HEREDITARY NATURE OF THE PROPERTY. THESE CELLS WERE ALSO RESISTANT TO 6-MERCAPTOPURINE AND SENSITIVE TO 8-AZAADENINE. RESISTANCE TO BOTH 8-AZA NUCLEOTIDE BASES WAS NOT ACCOMPANIED BY CHANGES IN KARYOTYPE BUT INVOLVED LOSS OF A SOL. ANTIGEN. BOTH SENSITIVE AND RESISTANT LINES HAD SIMILAR GUANYLIC ACID PYROPHOSPHORYLASE ACTIVITY, BUT THE SENSITIVE POPULATION WAS NOT ABLE TO UTILIZE EXOGENOUS HYPOXANTHINE. FACILITY: LAB. GENET. TUMOR CELLS, INST. CYTOL., LENINGRAD, USSR.

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TITLE--AMYLASE INDUCTION IN 1 CELLS. EFFECT OF THE MODE OF CELL  
HARVESTING ON THE AMOUNT OF REGISTERED AMYLASE ACTIVITY -U-  
AUTHOR--PODGAYETSKAYA, D.YA., GERSHUN, V.A., IGNATOVA, T.N., BLINOVA,  
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CIRC ACCESSION NO--AP0102884  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INCREASED AMYLASE ACTIVITY IN L  
CELLS AFTER ADDN. OF STARCH TO THEIR NUTRIENT TRYPSIN CONTG. MEDIUM  
INDICATE SUBSTRATE INDUCTION OF ENZYME SYNTHESIS. THE SIZE OF THE  
REGISTERED EFFECT COULD BE CHANGED BY DIFFERENT METHODS OF HARVESTING  
CELLS FROM THE GLASS. DURING MECH. OR SIMPLE HARVESTING, INDUCTION  
DECREASED.

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USSR

UDC 612.85

GAVRILOV, L. R., GERSHINI, G. V., IL'INSKIY, O. B., SIROTYUK, M. G., TSIRUL'-NIKOV, Ye. M., and TSUKERMAN, V. A., Laboratory of the Physiology of Hearing, Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Laboratory of the Physiology of the Sensory Organs, Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Laboratory of General Physiology of Reception, Institute of Physiology imeni I. P. Pavlov, and Laboratory of Ultrasonic Cavitation, Acoustics Institute, USSR Academy of Sciences

"Study of the Skin Sensitivity by Means of Focused Ultrasound"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 58, No 9, 1972, pp 1,366-1,371

Abstract: A study was made of the effect of focused ultrasound on the skin of a human hand. The sensitivity of the skin of the palm surface of the fingers, wrist and lower third of the forearm was investigated in five people (2 men and 3 women). The sensitivity thresholds were determined with a gradual increase and decrease in the stimulus. As a rule, the thresholds were higher with an increase in stimulus. The intensity for which no less than 50% positive responses occurred to 8-10 stimulations was taken as the threshold. Stimulation of the skin by identical stimuli with an intensity of 30-500 watts/cm<sup>2</sup> usually 1/2

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GAVRILOV, L. R., et al., Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenov, Vol 58, No 9, 1972, pp 1,366-1,371

aroused a tactile sensation, the nature of which depended on the stimulated section. When the focal point went deeper into the tissue, the tactile thresholds gradually increased and, finally, the sensation gradually went away altogether (and then in certain cases reappeared on the opposite side). The effect of sound streams on the occurrence of tactile sensations was tested leading to tickling sensations and sensations of heat and cold. Pain occurred at intensities of 1,400-1,600 watts/cm<sup>2</sup> lasting 100 milliseconds and more.

The mechanism of the effect of the focused ultrasound and its value in the study of the receptor structures are discussed. All the basic types of feelings in the skin can be isolated by the application of ultrasound.

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UDC 591.185.5:577.37

GERSHUNI, G. V., and MAL'TSEV, V. P., Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Academy of Sciences USSR, Leningrad

"Some General Features of Impulse Sequences in Bioacoustic Signals"

Leningrad, Zhurnal Evolyutsionnoy Biokhimii i Fiziologii, Vol 9, No 2, Mar/Apr 73, pp 162-176

Abstract: Sounds emitted by monkeys (*Cebus capucinus*), cats, albino rats, and chickens under various circumstances were recorded and analyzed. Significant differences were found in the duration of individual impulses and of the intervals between them, organization of impulses into packages, duration of impulse packages and of the intervals between them, and relative amplitudes and spectral components of impulses within a package. Frequency modulation, not observed among insects, appears to be a typical characteristic of mammals. The first and the last impulse in a package differ from each other, clearly denoting the beginning and the end. Organization of impulse packages occurs when the animal performs no definite motor activity and the sound is the main expression of motivational and emotional factors. During this so-called acoustic behavior, the packaged sound signals represent general orientation, a call, a greeting, or a threat addressed to another animal or man. On the other hand, non-packaged

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signals are emitted as an accompaniment to a definite motor activity, such as defense, aggression, or intake of food.

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UDC 612.851.88

ANOKHIN, P. K., GERSHUNI, G. V., et al., editors

Fiziologiya sensornykh sistem (Physiology of the Sensory System), pt 2, in the series: Rukovodstvo po fiziologii (Handbook of Physiology), 1972, "Nauka" Publishing House, Leningrad branch, 703 pp

Translation: Annotation: This volume examines a wide range of matters relating to the activity of the sense organs: hearing, equilibrium (vestibular apparatus), smell, touch, taste, pain and temperature sensitivity. Each section contains information on the physical and chemical properties of the external signal with which a given sense organ is connected and data on the structure of the peripheral and central divisions, psychophysiological characteristics of the activity of the sense organs, and biophysical and neurophysiological basis of their activity in detecting and differentiating the properties of external signals. The physiological basis of the perception of the most important acoustic signals for man, i.e., speech sounds, is also elucidated.

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GERSHUNI, G. V., Corresponding Member of the Academy of Sciences USSR (Editor)

Analiz Rechevykh Signalov Chelovekom (Analysis of Speech Signals by Humans),  
Leningrad, "Nauka," 1971, 214 pp

Translation: Annotation: Explanation for Transcription.

International Phonetic Transcription symbols are used to designate sounds in all of the works of this collection. It should be noted, however, that in designating the synthetic sounds, no attempt is made to reflect their phonation with greatest accuracy. In these cases the symbol is used not to designate the phonetic quality of the separate sound, but to designate the method of interpretation of the entire continuum of signals by the listeners. In this manner the transcription is not so much phonetic as phonematic.

The following designations require particular explanation: symbol [ɛ] has been accepted as the designation of the Russian vowel 6l [y -- translator]; a stroke is used to designate a softly pronounced consonant, with the stroke placed above and to the right of the main symbol, for instance [l'].  
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GERSHUNI, G. V., Analiz Rechevykh Signalov Chelovekom, Leningrad, "Nauka," 1971, 214 pp

When citing works of other authors the symbols used in the original work are retained.

In those cases in which the listeners wrote down the results of their analysis using Russian letters, the symbols of the Russian alphabet were also used to describe the obtained data.

Foreword: This publication is the seventh volume of the collection of works "Problemy Fiziologicheskoy Akustiki" (Problems of Physiological Acoustics), the publishing of which began in 1949, under the general editorship of L. A. Orbeli. This volume, entitled "Analiz Rechevykh Signalov Chelovekom," is a collection of works in which the trend of investigations reflected in volume five of "Problemy Fiziologicheskoy Akustiki," which is entitled "Mekhanizmy Recheobrazovaniya i Vospriyatiya Slozhnykh Zvukov" (Mechanisms of Speech Formation and Perception of Complex Sounds), and the book "Rech', Artikulyatsiya i Vospriyatiye" (Speech, Articulation and Perception) (Leningrad, 1965) is continued.

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GERSHUNI, G. V., Analiz Rechevykh Signalov Chelovekom, Leningrad, "Nauka," 1971, 214 pp

The published articles are linked by a general system of outlooks regarding the structure of the speech perception process and regarding the paths of approach to the experimental development of the problem. This system of concepts is presented in a more complete form in the collective work of L. V. Bondarko, N. G. Zagoruyko, V. A. Kozhevnikov, A. P. Molchanov, and L. A. Chistovich "Model' Vospriyatiya Rechi Chelovekom" (Model of Speech Perception by Humans) (Novosibirsk, 1968).

The basic assumption is that the basic perception process has a multilayer structure. At the initial stage of processing -- the stage of sound analysis -- the identification and measurement of specific parameters, signal criteria take place. For the purpose of designating the characteristics of the signal on the basis of these criteria, the term sound signal description is used in the articles of the collection of works. The speech perception model which was developed assumes that at the successive stages of the transformation of information, a transition to such an abridged and abstract form of description is accomplished which makes possible the memorization and

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further linguistic analysis of relatively long sections of a verbal report, and can be directly utilized for the regulation of speech formation processes when reproducing the signal. This level of description is conditionally known as phonetic description, while the transition process from sound to phonetic description is defined as phonetic interpretation.

All of the articles in this collection of works are grouped around two basic problems which emanate from what has been said above. One of these is concerned with the acoustic description and determination of signal criteria acoustically measured, and the development of models which secure the accomplishment of the necessary measurements. The second problem is concerned with the structure of the phonetic description and procedure of phonetic interpretation.

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USSR

GERSHUNI, G. V., Analiz Rechevykh Signalov Chelovekom, Leningrad, "Nauka,"  
1971, 214 pp

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USSR

UDC 534.7

GAVRILOV, L. R., GERSHUNI, G. V., IL'INSKIY, O. B., POPOVA, L. A.,

"Stimulation of Human Peripheral Nerves by Focused Ultrasound"

Moscow, Akusticheskiy Zhurnal, No 4, 1974, pp 519-523

Abstract: Stimulation of the fingers, palm, and lower third of the forearm of 5 subjects by focused ultrasound at frequencies of 0.48, 0.887, 1.95 and 3.67 MHz produced 3 types of sensations - tactile, temperature, and pain. The thresholds varied with the type of sensation, being lowest for the tactile sensations. The thresholds rose as the focal range was shifted from the fingers to the palm and then to the forearm. (Ultrasound directed at certain spots on the palm and forearm produced a distinct sensation of cold, an unusual response because it is physically impossible for ultrasound to chill the tissues). The thresholds of the tactile sensations were virtually independent of the duration of exposure to ultrasound lasting 1 to 100 msec. However, they rose considerably when the duration was decreased to 0.1 msec or less. Some suggestions are made for constructing ultrasonic apparatus to be used for stimulating nerve structures.

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USSR

GERSHONI, G. Z., ZHUKHOVITSKIY, YE. M., YURKOV, YU. S.

"Concerning Convective Stability in the Presence of a Periodically Changing Parameter"

Prikladnaya Matematika i Mekhanika, Vol 34, No 3, 1970, pp 470-480

Abstract: Convective stability is parametrically affected primarily in two ways: modulation of the equilibrium temperature gradient and modulation of the field of external forces. Modulation of the temperature gradient can be effected by means of periodic change, with time, of the temperature at the boundaries of a cavity containing a fluid. Modulation of the field of external forces (the gravity field) originates in the presence of vertical vibrations of the fluid. These mechanisms of parametric action generally differ. By virtue of the temperature skin effect, periodic change of the temperature at the boundaries of the cavity with time brings about modulation of mass (convective) force only in a certain layer, the thickness of which decreases as the frequency increases. In the case of vertical vibrations of a cavity filled with fluid, on the

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USSR

GERSHUNI, G. Z., et al, Prikladnaya Matematika i Mekhanika, Vol 34, No 3, 1970, pp 470-480

other hand, modulation of the convective force is effected (in an incompressible fluid) uniformly throughout the entire volume. This distinction vanishes at comparatively low frequencies, when the thickness of the thermal skin effect is sufficiently large in comparison to the characteristic linear dimension of the cavity. In this limit case the two methods of parametric action are essentially equivalent. The present work continues an investigation published earlier, dealing with the stability of a flat horizontal layer of liquid with free boundaries, with periodic modulation of the vertical temperature gradient, special attention being directed to the low-frequency range, when the temperature skin effect may be disregarded. The present article deals with the effect of parametric action (modulation of the vertical temperature gradient or the gravity field) upon the stability of equilibrium in a flat horizontal layer with free and solid boundaries as well as in a vertical circular cylinder. By means of the Kantorovich method the equation system for perturbations is reduced to a system of conventional equations for time-dependent amplitude equations. Periodic solutions of these equations for the case of sinu-

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USSR

GERSHUNI, G. Z., et al, Prikladnaya Matematika i Mekhanika, Vol 34,  
No 3, 1970, pp 470-480

soidal modulation were obtained on a digital electronic computer  
by the Runge-Kutta method. The stability boundaries are determined  
in relation to the modulation parameters. The limiting case of high  
frequencies is discussed.

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- 79 -

USSR

UDC: 621.372.8:621.385.63

GESTRINA, G. N.

"Radiation of Electron Fluxes Moving Within a Periodic Annular Waveguide"

Radiotekhnika. Resp. mezhved. nauch.-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 13, pp 33-36 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5B110)

Translation: The author studies the properties of diffraction emission which arises in an annular waveguide filled with two electronic fluxes, one of which is density-modulated. It is proved that the introduction of an unmodulated flux may lead to amplification or attenuation of emission. Bibliography of three titles. Résumé.

1/1



Graphite

USSR

UDC 546.831+546.26

GERT, L. M., and BABAD-ZAKHRYAPIN, A. A.

"Interaction of Zirconium Vapors with Graphite"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, Vol 8,  
No 2, 1971, pp 381-382

Abstract: The authors selected zirconium as a condensing metal to determine the possibility of appearance of complex phases during condensation of vapors of a transition metal on a heated graphite substrate. The phase composition of the layers was determined by x-ray analysis. The influence of layer growth rate on oxygen and nitrogen content was studied. The data presented indicate that the second phase, present in the surface layers, is a complex phase containing carbon, as well as nitrogen or nitrogen and oxygen simultaneously. It is apparently best represented by the formula  $ZrC_{1-x}(O,N)_x$ .

1/1

Receivers and Transmitters

USSR

UDC 621.394.61

GERTIG, O. Yu., YERSHOV, V. N.

"A Transmitter of Frequency-Keyed Oscillations Without Phase Interruption"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 2, Jan 71, Author's Certificate No 290474, division H, filed 22 Oct 68, published 22 Dec 70, pp 165-166

Translation: This Author's Certificate introduces a transmitter of frequency-keyed oscillations without phase interruption which contains an amplitude-modulated carrier frequency oscillator, a keyer, coincidence circuits and a power amplifier. As a distinguishing feature of the patent, the transmission frequency is raised while simultaneously improving stability by connecting a harmonic modulating frequency oscillator to the input of the amplitude modulator for the carrier frequency oscillator. The output of this modulator is connected to the inputs of two parallel-connected narrow-band filters whose outputs are connected through the coincidence circuits to the power amplifier. The second inputs of the coincidence circuits are connected to the outputs of the keyer, which is controlled by the signal from the modulating frequency oscillator.

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USSR

UDC 621.318.2

GERTMAN, YU. M., DUBROV, N. F., and GLOTOVA, L. S., UralNIICHM [expansion unknown]

"Effect of Texture on the Change of Magnetic Properties of Alloy 79LM"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 29, No 5, May 70, pp 963-967

Abstract: A study was made of the dependence of magnetic characteristics of 0.1- and 0.35-mm-thick strip on the degree of finite cold deformation. It is shown that direct cold strip rolling from a thickness of 6-3 mm to 0.35 or 0.1 mm and subsequent vacuum annealing at  $1150^{\circ}$  for a period of 4 hrs leads to an increase in magnetic permeability<sub>max</sub> and magnetic permeability<sub>0</sub> up to  $\sim 20\%$  as compared to strips which had undergone intermediate annealing. The improvement of magnetic properties was observed only during the use of protective coatings of the pure magnesium type which do not impede the development of crystalline texture.

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Physical Properties

USSR

UDC: 669-12.017

DUBROV, N. F., and GERTMAN, YU. M.

"Influence of Annealing Temperature on Texture and Magnetic Properties of 50N and 79 NM Permalloy Alloys"

Izv. VUZ, Chernaya Metallurgiya, No 6, 1970, pp 112-116

Abstract: The best cubic texture in 97-98.5% deformed strips of 50N and 79NM alloys annealed at 1000-1300° C was produced with  $t_{ann} = 1100-1150^{\circ} \text{C}$ . As  $t_{ann}$  is increased to 1200° C and more, secondary recrystallization occurs in the strips with grains of different orientations and the cubic texture becomes poor. The highest magnetic characteristics ( $\mu_{max}$ ,  $B_r$ ) in the magnetically anisotropic alloys 50N and 79NM were produced for specimens with the best cubic structure. The highest values of maximum permeability, 500,000 and 90,000 gs/oe in 79NM and 50N alloys, respectively, were produced after four hours' annealing at 1150 and 1200° C, respectively. In low-textured strips deformed by 60% before annealing, lower values of  $\mu_{max}$  and residual magnetism were produced than in the textured strips. Five illustrations; 12 biblio. refs.

1/1

USSR

UDC: 681.32.001

ANDRUSHKYAVICHUS, R. R., VALTERIS, S. E., GERTNERIS, I. Kh.

"Some Problems of Analyzing the Magnetic Elements of Computers"

Techn. kibernetika, Tekhn. kibernetika (Technical Cybernetics), Kaunas, 1970, pp 311-317 (from RZh-Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 9, Sep 70, Abstract No 9B214)

Translation: This article contains an investigation of the dynamic state equations of a magnetic core with a rectangular hysteresis loop taking into consideration the process of pulsed magnetic reversal of the magnetic cores. The results from numerical calculations on a digital computer are presented. There are three illustrations and a three-entry bibliography.

1/1

USSR

UDC: 681.32.001

VALTERIS, S. E., GERTNERIS, P. Kh.

"Calculating the Threshold Recording Level in Magnetic Storage Elements"

Techn. kibernetika, Tekhn. kibernetika (Technical Cybernetics), Kaunas, 1970, pp 318-321 (from RZh-Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 9, Sep 70, Abstract No 9B216)

Translation: An analytical relation is derived for the stored induction level in a magnetic storage element as a function of the parameters of the stored pulses, the recording circuit, and the magnetic core. The probability that the stored induction level will be within the range insuring a constant number of stored pulses is determined. The bibliography has two entries.

1/1

USSR

GERTSBAKH, I. B.

"One Problem of Selection of the Sequence of Performance of Dependent Experiments"

Teoriya Veroyatnostey i Ee Primeneniya [Theory of Probabilities and its Applications], 1972, Vol 17, No 4, pp 752-755 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V11, by V. Ivanov).

Translation:  $n$  experiments are conducted with numbers  $1, 2, \dots, n$  in the sequence fixed by a certain permutation  $\tau_n = (i_1, i_2, \dots, i_n)$  from the set of all permutations  $T$ . As a results of the  $r$ th step (the experiment numbered  $i_r$ ), random quantity  $x_r(\tau_n)$  is produced, which taken on values of 0 or 1 with the distribution

$$P\left\{X_r(\tau_n) = 1 \mid \sum_{j=1}^{r-1} X_j(\tau_n) = m\right\} = p_{i_r}(m),$$

$$m = \overline{0, r-1}, \quad r = \overline{1, n}, \quad 1 \leq i_r \leq n.$$

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USSR

Gertsbakh, I. B.

Teoriya Veroyatnostey i Ego Primeneniya, 1972, Vol 17, No 4, pp 752-755.

Conditions are found which must be imposed on the matrix

in order that the permutation  $\tau_n^* = (n_1, n - 1, \dots, 1)$  is optimal in the sense of  $V(\tau_n^*) = \max_{\tau_n \in \Gamma} V(\tau_n)$ , where  $V(\tau_n) = E \left\{ \sum_{k=1}^n X_k(\tau_n) \right\}$  is the mean number of successes in  $n$  steps.

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ATO 033261

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FROM: FBIS, Foreign Press Digest, Cybernetics in the USSR, 28 Jan 70, FPD 0006  
38. USSR UDC 629.135: 62-50 + 007:519

VENEVTSSEV, V. M., GERTSBERG, I. B., KORDONSKIY, Kh. B., LINIS, V. K., MAKSIM, M. S.

"Heuristic Method of Compiling the Passenger List for Aircraft Traffic using  
Computers"

Avtomatizatsiya Umstvennogo Truda v Mashinostroyenii: Moscow, "Nauka" Publishing  
House, 1969, pp 137-160

Abstract: The procedure for compiling the passenger list consists in centralized  
tying together of the plans for the lists compiled by individual subdivisions. This  
coordination is a highly complex process in which frequently contradictory require-  
ments of a commercial nature and restrictions connected with flight safety must be  
reconciled. The article contains investigations of the basic features of human  
activity with respect to compiling the schedule and polarization of these activities  
with the help of a series of heuristic algorithms. There is a description of the  
basic heuristics determining the order of arrangement of trips and the method of  
optimal arrangement of an individual trip. Priority in the arrangement of trips is

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realized on the basis of a specific probability number. Results are presented from statistical experiments permitting us to judge the high efficiency of the point evaluation. The article contains investigations of the problems of computer execution of the proposed heuristic rules, special features of memory organization, and a number of practical and theoretical aspects of the problem. The article contains seven illustrations and a bibliography of one entry.

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Pesticides

USSR

UDC 632.934.1:546.57-386

KUZNETSOV, A. YA., BAYGOZHIN, A., BEYM, I. G., MIRONOV, V. YE.,  
Leningrad State Pedagogical Institute imeni A. I. GBRTSEN

"Study on the Light Sensitivity and Fungicidal Properties of  
Silver Complexes"

Leningrad, Zhurnal prikladnoy Khimii, Vol 64, No 10, Oct 71,  
pp 2311-2315

Abstract: Dense shielding of a silver ion by various ligands without reducing properties makes it possible to obtain photo-stable complexes. This study concerns the quantitative aspects of the light sensitivity, thermal stability, and the fungicidal properties of a number of silver compounds with high light sensitivity. The highest light resistance (1 year+) was shown by tris-1,10-phenanthroline perchlorate. The high light resistance is attributed to the dense shielding of the silver ion by three large ligand molecules which hinder the charge transfer to  $Ag^+$  from outer-sphere ions as well as to the low electron donor capacity of the outer-sphere perchlorate ion. It is noteworthy that  
1/2

UZNETSOV, A. YA., et al, Zhurnal prikladnoy Khimii, Vol 64,  
No 10, Oct 71, pp 2311-2315

high light resistance is typical of thermally stable compounds. Bis-2,2'-biimidylsilver nitrate was the only compound to pass the standard tests for biological activity (15 days). Silver complexes with 1,10-phenanthroline and ethylenethiourea also show promise with regard to both light resistance and biological activity. These compounds must be used in the form of nitrates or perchlorates with a co-ordination-saturated inner sphere. Test data on the light resistance and biological activity of complex silver compounds, their formulas, ligands, complex concentration in solution and test durations are given.

2/2

1/2 018 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--OXIDATIVE CHLORINATION OF TOLUENE. 1. EFFECT OF THE COMPOSITION OF  
THE CHLORINATING MIXTURE AND TEMPERATURE ON THE OXIDATIVE CHLORINATION  
AUTHOR--SOLOMONOV, A.B., GERTSEN, P.P., KETOV, A.N.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(2), 471-2  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHLORINATION, OXIDATION, TOLUENE, THERMAL EFFECT, CHEMICAL  
REACTION RATE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1987/1216 STEP NO--UR/0080/70/043/002/0471/0472  
CIRC ACCESSION NO--AP0104582

2/2 018

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0104582

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. MAX. YIELD OF CHLORINATED PRODUCTS (O AND P-CHLOROTOLUENES AND PHCH SUB2 CL) OF OXIDATIVE CHLORINATION OF PHME USING CU CHLORIDES AS CATALYST WAS OBTAINED WITH 30PERCENT OF HCL IN AIR AND STOICHIOMETRIC RATIO OF REACTANTS. RATE DEYD. REACTION IS OXIDN. OF HCL TO CL. AT HIGHER TEMPS., THE YIELD OF PRODUCTS INCREASED IN ACCORDANCE WITH INCREASED RATE OF OXIDN. OF HCL IN AIR.

0123

USSR

UDC 528.716.1.021

GILL', I. L., and GERTSENOVA, K. N.

"Test Results of the Airplane Radiotelemeter TsNIIGAIK (Central Scientific Research Institute of Geodesy, Aerial Survey and Cartography) in Mountain Region"

Moscow, Geodeziya i Kartografiya, No 6, 1972, pp 40-43

Abstract: The airplane radiotelemeter of the TsNIIGAIK was for the first time tested in an experimental mountain region in the year 1970, in order to determine the working characteristics of the apparatus in regions with possibly increased reflection of radio waves from earth's surface. The altitude differences of check points of the 250 km<sup>2</sup> experimental section comprised 1200 m. Results of measuring the basis from 5000 m altitude were used for rating the exactness of radiotelemeter measurements at small distances (~25 km) between airplane and ground stations. The error in measuring the basis, determined from deviations from the mean value, was  $\pm 1.8$  m and according to deviations from the geodetic basis length  $\pm 2.1$  m. The test results of the airplane radiotelemeter in the mountain region indicate the possibility of its use for establishing a planned basis of topographic survey of mountain regions in 1:25000 scale. The distance between the airplane and ground stations has not to be less than 40-50 km and there have not to be obstacles for the passing of radio waves on the ray path airplane-ground station. Two tables, two biblio. refs.

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# TECHNICAL TRANSLATION

Doc / PSICAIT 23-2025-72

29 April 72

ENGLISH TITLE: PROBLEMS OF LASER BEAM DATA TRANSMISSION  
PROCEEDINGS OF THE FIRST ALL-UNION CONFERENCE, KIEV,  
SEPTEMBER 1968

FOREIGN TITLE: PROBLEMY PEREDACHI INFORMATSII LAZERNYH IZLUCHENIYEH

AUTHOR: I. A. DERYUGIN, ET AL.

SOURCE: KIEV ORDER OF LENIN STATE UNIVERSITY  
IMENI T.G. SHEVCHENKO

Translated for FSTC by AGSI

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- 1 of 2 Pages -

Amplifiers

USSR

UDC 621.375.93.002.2

GERTSENSHTEYN, M. YE., KOSTIN, A. A., MAGNUSHEVSKIY, V. R., MARKOV, V. V.,  
SOBOLEVA, O. A., SOLOVEY, L. G., Active Members of the Society

"Plug-in Module for a Wide Band Parametric Amplifier"

Moscow, Radiotekhnika, No 11, 1971, pp 105-107

Abstract: A description is presented of a miniature modular design of a centimeter-range parametric amplifier with integral structure of the oscillatory systems. The operating principle of the module is discussed, and schematic diagrams of basic elements are presented. The primary oscillatory system comprises a varactor diode and an auxiliary lumped inductance included in series with respect to the signal frequency. The pass band of the module is actually determined by the time constant of the diode and is 8-9% of the operating frequency at a level of 1 decibel with amplification of 10-11 decibels. Further expansion of the pass band to 11-12% of the operating frequency is obtained by using a second corrector. The frequency-amplitude characteristic of the module with the additional corrector is presented. The application of a step structure as the corrector, transformer and rejector of the other frequencies permits optimal coupling of the

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USSR

GERISENSHTEYN, M. YE., et al, Radiotekhnika, No 11, 1971, pp 105-107

primary oscillatory system to the matching quadripole in the signal circuit and realization of pass bands of the parametric module which are limiting for the diode used. This design is applicable in all cases where the series resonance frequency of the diode is between the signal frequency and the open-circuit frequency.

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USSR

UDC: 621.375.7

GERTSENSHTEYN, M. Ye., LEVINZON, F. A., BELOV, A. A., TETEL'BAUM, B. I.

"Three-Frequency Parametric Circuit as a Negative Capacitance"

Moscow, Radiotekhnika i Elektronika, Vol. 16, No 6, Jun 71, pp 990-995

Abstract: This paper discusses conditions for realizing negative capacitance in the video frequency range by means of a three-frequency parametric circuit, which is of interest for operation of a parametric video amplifier from a capacitive circuit. It is shown that in the case of a certain detuning of the output circuit relative to the pumping frequency and fairly low amplitude of the second harmonic, negative capacitance may be realized in a predetermined video frequency range in the nonlinear capacitance spectrum. A formula is derived for the maximum possible negative capacitance. Experimental and theoretical curves are compared for the insertion capacitance at the input of a reactive video amplifier for various values of detuning of the output tank and various circuit parameters.

The analysis shows that realization of negative capacitance in the form of a three-frequency parametric circuit requires positive detuning of the output circuit, and a very low coefficient of modulation of the nonlinear capacit-

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... .., et al, Radiotekhnika i Elektronika, Vol. 16, No 6,

... .. to the second harmonic. The negative capacitance may be kept  
... .. over the predetermined video frequency range.

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USSR

UDC 621.396.62.029.6:621.391.822

GERTSENSHTEYN, M. YE., SOLOVEY, . L. G. and VERKHOVYKH, N. P.

"Determination of the Noise Factor of a Microwave Receiver"

Moscow, Radiotekhnika, Vol 25, No 1, Jan 70, pp 70-73

Abstract: This article presents an attempt to standardize the definition of the noise factor, taking the concordance of the noise source and transmission line into account. The use of wave resistance of the transmission line as a standard impedance in the problems of noise measurement is recommended. The proposed definition states that the single channel differential noise factor of a device is the ratio of the total noise power emitted at the output load on operational frequency at standard noise temperature ( $T=293^{\circ}\text{K}$ ) of the signal source, consistent with communication line, to the part of this power determined by the source. Justifications underlying the proposed definition are developed on the basis of tuning and operation conditions of various amplifiers and receivers considered here. Original article has 2 figures and 7 formulas.

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GERTSENSHTEYN

M. YE.

Acc. Nr.: AP0040395

Ref. Code: UR 0108

JPRS 50248

USSR

UDC 621.396.62.029.6:621.391.822

GERTSENSHTEYN, M. YE., SOLOVEY, L. G., and VERKHOVYKH, N. P.

"Determination of the Noise Factor of a Microwave Receiver"

Moscow, Radiotekhnika, Vol 25, No 1, Jan 70, pp 70-73

Abstract: This article presents an attempt to standardize the definition of the noise factor, taking the concordance of the noise source and transmission line into account. The use of wave resistance of the transmission line as a standard impedance in the problems of noise measurement is recommended. The proposed definition states that the single channel differential noise factor of a device is the ratio of the total noise power emitted at the output load on operational frequency at standard noise temperature ( $T=293^{\circ}\text{K}$ ) of the signal source, consistent with communication line, to the part of this power determined by the source. Justifications underlying the proposed definition are developed on the basis of tuning and operation conditions of various amplifiers and receivers considered here. Original article has 2 figures and 7 formulas.

Reel/Frame

19741844

USSR

UDC 642.43.011:533;621.5:533

GERTSENHTEYN, S. YA. and KASHKO, A. V.

"The Stability of an Axial-Symmetrical, Compressible, Nonviscous Wake"

Moscow, Nauch. tr. In-t mekh. Mosk. un-ta (Scientific Transactions of the Institute of Mechanics of Moscow University), No 19, 1972, pp 142-150 (from Referativnyy Zhurnal -- Mekhanika, No 4, 1973, Abstract No 4B395 by L. V. Nosachev)

Translation: The results of calculating the stability of flow in the wake behind a body flying with a supersonic velocity are presented. The wave number, velocity distribution and coefficient of amplification, characteristic for the oscillation in the wake were obtained. The dependence of these values on the Mach number and on the temperature drop on the wake axis and on the periphery were considered. As an example the flow in the wake behind a body in the range of Mach numbers from 10 to 30 was considered. It follows from the calculation presented that with an increase in the Mach number of the extremal wave number, the corresponding maximum coefficient of amplification decreased, while the phase velocity remained almost unchanged.

A comparison of the results obtained with well known results on the stability of planar jets was conducted. The comparison shows that the coefficients

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USSR

GERTSENSHTEYN, S. YA. and KASHKO, A. V., Nauch. tr. In-t mekh. Mosk. un-ta,  
No 19, 1972, pp 142-150

of amplification for planar jets are approximately four times higher than for  
axial-symmetrical jets.

2/2

- 11 -

1/2 019 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--OBSERVATION SYSTEM OF THE 70-GEV PROTON SYNCHROTRON -U- /

AUTHOR--(05)-BOLSHAKOV, YU.D., GERTSEV, K.F., IVANOV, YU.S., KUZMIN, A.A.,  
RUBCHINSKIY, S.M.  
COUNTRY OF INFO--USSR

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SUBJECT AREAS--PHYSICS

TOPIC TAGS--PROTON ACCELERATOR, SYNCHROTRON, PARTICLE MOTION, TRAJECTORY  
MEASUREMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1985/0787

STEP NO--UR/0000/70/000/000/0001/0012

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2/2 019

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AM0101160

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE BEAM ORBIT OF THE IHEP SYNCHROTRON IS DETERMINED BY MEASURING THE DISPLACEMENT OF THE CENTER OF GRAVITY OF ACCELERATED PARTICLE BUNCHES WITHIN 85 AZIMUTH POINTS. A SPECIAL SYSTEM IS DESCRIBED WHICH ALLOWS A DETERMINATION OF THE POSITION OF THE CLOSED ORBIT, AS WELL AS THE FREQUENCY, AMPLITUDE, AND PHASE OF THE COHERENT BETATRON OSCILLATIONS. THE EQUIPMENT ASSURES A PRECISION MEASUREMENT OF THE ORBIT DEPALCEMENT OF PLUS (5 TO 7)PERCENT PLUS 1 MM FOR AN INTENSITY OF  $10^{11}$  TO  $10^{14}$  PROTONS AND 10 TO 15PERCENT FOR AN INTENSITY OF  $10^{10}$  PROTONS. FACILITY: ADADEMIYA NAUK SSSR, MOSCOW. RADIOTEKHNICHESKII INSTITUT.

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PROCESSING DATE--30OCT70

2/2 018  
CIRC ACCESSION NO--AP0112602

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HNO SUB3 SOLNS. OF LN (ND, PR, EU, DY, HO, ER, AND YB) NITRATES CONTAIN LN PRIME3 POSITIVE, LN(NO SUB3) SUB3 .HNO SUB3, AND LN(NO SUB3) SUB3 .3HNO SUB3. COMPLEXING IN LN PRIME3 POSITIVE-HNO SUB3-H SUB2 O SYSTEMS WAS DETD. SPECTROPHOTOMETRICALLY AND FORMATION CONSTS. WERE CALCD. BY THE LEAST SQUARES METHOD. THE MECHANISM OF LN PRIME3 POSITIVE EXTN. BY BU SUB3 PO SUB4 FROM HNO SUB3 SOLN. IS DISCUSSED. IT IS ASSUMED THAT AT THE CONDITIONS WHERE LN(NO SUB3) SUB3 .HNO SUB3 FORMS AT THE HIGHEST YIELD, THE DISTRIBUTION COEFF. D OF LN PRIME3 POSITIVE HAS THE LOWEST VALUE. THE MARKED INCREASE OF D AT HNO SUB3 CONCNS. LARGER THAN 5M IS DUE TO THE FORMATION OF LN(NO SUB3) SUB3 .3HNO SUB3 WHICH IS EXTD. BY BU SUB3 PO SUB4.

UNCLASSIFIED

GERTSIK, Ye. M.

Electrochemical  
Controls

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Name	Reliability Factor	Area of Interest	Pages
Bychkovskiy, S. K.	5	Condensate removal from fuel cells	10, 29
Chepur, A. G.	3	Semiconductor physics	15
Cherbasakiy, A. Kh.	2	Thermoelectric applica- tions	8, 11, 13, 23
Chernov, Ya. I.	2	Gas, cap solar cells	12
Chervinskoye, G. A.	5	Wide film solar converters, thermionic converters	-
Chisolk, S. P.	2	Structure of zirconia	45
Dolitskiy, G. S.	2	Si solar cells	12
Damaskina, I. I.	2	Solar thermionics	-
Deyev, Mikhail Fedorovich	3	Semiconductor physics	15
Diligiul, V. I.	2	Semiconductor physics	15
Dobrenko, Vasiliy Ye.	4	H <sub>2</sub> -O <sub>2</sub> fuel cells	10, 26, 43
Dolgov, V. N.	2	Solar cell application	12
Dud'ko, L. D.	2	Thermionics	8, 11, 13, 25
Fedorin, V. A.	2	Electrochemical controls	10, 43
Fedosyeva, O. P.	3	Si solar cells, radiation detectors	12
Ganin, Ye. A.	2	Thermoelement design	13
Garman, Samuil Abramovich	5	Electrochemical controls	10, 33, 43
Gertsik, Ye. M.	2	Electrochemical controls	9, 10, 11, 12, 43
Gilberman, Anatoliy Yekovlevich	3	Solar cells	12
Golitsyn, N. M.	5	First Deputy Director (1966)	7

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ABR/MAEST/PUS17-72-1-71

ORGANIZATION AND ACTIVITIES OF THE ALL-UNION  
SCIENTIFIC RESEARCH INSTITUTE OF CURRENT  
SOURCES

USSR

UDC 669.715.004.82

LARIONOV, G. V., and GERTSUK, N. A.

"The Problems of the Optimal Furnace for Melting of Aluminum Waste and Scrap" (Continuation of the Discussion on Improving the Production of Secondary Aluminum)

Tsvetnyye Metally, No 3, Mar 71, pp 67-69

Abstract: The operation of induction, flame (reflector), and drum rotary furnaces is studied. Recommendations are given for the use of furnaces of each type for melting various types of scrap.

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Abstract: The operation of induction. flame (reflector), and drum rotary furnaces is studied. Recommendations are given for the use of furnaces of each type for melting various types of scrap.

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1/2 021 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--BIOLOGICAL EFFECTIVENESS OF PROTONS AND GAMMA RAYS FOR CARROTS  
DURING PRESOWING IRRADIATION OF SEEDS -U-  
AUTHOR-(02)-GERTSUSKIY, D.F., ALEKSEYENKO, L.V.  
COUNTRY OF INFO--USSR  
SOURCE--RADIOBIOLOGIYA 1970, 10(1), 94-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--AGRICULTURE CROP SEED, PROTON RADIATION BIOLOGIC EFFECT, GAMMA  
RADIATION, COBALT ISOTOPE, RADIATION DOSAGE, RADIATION PLANT EFFECT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1998/0458 STEP NO--UR/0205/70/010/001/0094/0097  
CIRC ACCESSION NO--AP0121132  
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2/2 021

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PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121132

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PRIME60 CO GAMMA RAYS (1-200 KRADES) AND 630 MEV PROTONS (1-100 KRADES) WERE USED, LETHAL DOSES BEING 150 AND 50 KRADES, RESP. NONE OF THE DOSES OF IRRADN. RESULTED IN AN INCREASE IN THE CROP. OVER THE DOSE INTERVAL OF 1-20 KRADES NO DIFFERENCES WERE FOUND BETWEEN THE ACTIONS OF PROTONS AND GAMMA RAYS. FOR HIGHER DOSES THE ACTION OF PROTONS WAS MUCH STRONGER THAN THAT OF GAMMA RAYS. IRRADN. WITH PROTONS IN LOW DOSES (1-5 KRADES) RESULTED IN A SLIGHT STIMULATION OF THE INITIAL GROWTH. FACILITY: INST. MED.-BIOL. PROBL., MOSCOW, USSR.

UNCLASSIFIED

1/2 015

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--MANUFACTURE OF GALVANIC CELLS -U-

AUTHOR--(05)-NABIULIN, F.K., BUZOVA, Z.M., GERTYK, E.M., MARFIN, B.V.,  
RABINOVICH, V.A.

COUNTRY OF INFO--USSR

SOURCE--U.S. 3,506,750

DATE PUBLISHED--14APR 70

SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE)

TOPIC TAGS--PATENT, GEL, BATTERY ELECTROLYTE, BATTERY ELECTRODE,  
ELECTROLYTIC CELL, VALVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1990/1798

STEP NO--US/0000/70/000/000/0000/0000

CIRC ACCESSION NO--AA0109759

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